

We claim:

- 1           1.     In a radio communication system having at least a first mobile  
2     node operable to communicate with a network part, the network part having a  
3     first network portion and at least a second network portion, the first network  
4     portion operated by a first network operator and the at least the second  
5     network portion operated by at least a second network operator, a selected one  
6     of the first network portion and the at least the second network portion  
7     forming a home-network portion associated with the mobile node, an  
8     improvement of apparatus for facilitating communication of the mobile node  
9     when roaming beyond the home-network portion associated therewith, said  
10    apparatus comprising:  
  
11           a detector adapted to receive positional information associated with the  
12    mobile node, the positional information communicated by the mobile node to  
13    the network part at selected times when the mobile node communicates with  
14    the network part, said detector for detecting values of the positional  
15    information and for forming indications of the values of the positional  
16    information;  
  
17           an associator coupled to said detector to receive the indications formed  
18    by said detector of the values of the positional information, said associator for  
19    associating positioning of the mobile node together with one of the first and at  
20    least second network portions, respectively, to which the positional  
21    information is communicated, thereby to indicate, if the one of the network  
22    portions, with which the positioning information indicates the mobile node to  
23    be associated, is other than the home-network portion; and  
  
24           a storage element coupled to said associator, said storage element for  
25    storing values representative of associations formed by said associator, the  
26    values together forming a roaming network table indicating with which of the  
27    network portions the mobile node is capable of communicating.

1           2.       The apparatus of claim 1 wherein the mobile node has an  
2   identifier associated therewith and wherein said detector is further adapted to  
3   receive the identifier and for detecting values thereof.

1           3.       The apparatus of claim 2 wherein the radio communication  
2       system comprises a cellular radio communication system that provides for  
3       GPRS (General Packet Radio Service) and wherein the identifier associated  
4       with the mobile node comprises at least a portion of an IMSI (International  
5       Mobile               Subscriber               Identity)               number.

1           4.       The apparatus of claim 3 wherein the IMSI number includes a  
2   Mobile Network Code (MNC) and wherein the at least the portion of the IMSI  
3   number of which said detector detects the values comprises the Mobile  
4   Network Code, the Mobile Network Code identifying the home network  
5   portion associated with the mobile node.

1           5. The apparatus of claim 3 wherein the IMSI number includes a  
2 Mobile Country Code (MCC) and wherein the at least the portion of the IMSI  
3 number of which said detector detects the values comprises the Mobile  
4 Country Code.

1           6.       The apparatus of claim 1 wherein the mobile node registers with  
2 the network part at selected times and wherein the positional information  
3 detected by said detector is communicated by the mobile node pursuant to  
4 registration with the network part.

1           7.       The apparatus of claim 1 wherein communications of the mobile  
2 node are formatted into messages, the messages having header parts, and  
3 wherein the positional information detected by said detector is embodied in  
4 the       header       parts       of       the       messages.

1           8.     The apparatus of claim 2 wherein said associator further  
2     identifies the mobile node whose positioning is associated together with the  
3     one of the first and at least second network portions.

1           9.     The apparatus of claim 1 wherein the roaming network table  
2 further includes an indication of a time at which the values representative of  
3 the associations are stored at said storage element.

1           10.    The apparatus of claim 9 further comprising a roaming table  
2 entry deleter coupled to said storage element, said roaming table entry deleter  
3 selectably operable to delete selected values of the roaming entry table  
4 maintained at said storage element.

1           11.    The apparatus of claim 10 wherein said roaming table entry  
2 deleter deletes values of the roaming entry table stored thereat for longer than  
3 a selected time period.

1           12.    The apparatus of claim 1 wherein the radio communication  
2 system comprises a multi-user system, wherein the at least the first mobile  
3 node comprises a plurality of mobile nodes, wherein said detector detects  
4 communications of any of the plurality of the mobile nodes, wherein said  
5 associator associates positioning of any of the plurality of mobile nodes, and  
6 wherein the roaming network table formed at said storage element includes  
7 values associated with any of the plurality of mobile nodes.

1           13.    In a method of communicating in a radio communication system  
2 having at least a first mobile node operable to communicate with a network  
3 part, the network part having a first network portion and at least a second  
4 network portion, the first network portion operated by a first network operator  
5 and the at least the second network portion operated by at least a second  
6 network operator, a selected one of the first network portion and the at least  
7 the second network portion forming a home-network portion associated with  
8 the mobile node, an improvement of a method for facilitating communication  
9 of the mobile node when roaming beyond the home-network portion  
10 associated therewith, said method comprising:

11           detecting values of positional information, the positional information  
12 associated with the mobile node and communicated by the mobile node to the

13 network part at selected times when the mobile node communicates with the  
14 network part;

15 associating positioning of the mobile node together with one of the first  
16 and at least second network portions, respectively, to which the positional  
17 information is communicated, thereby to indicate, if the one of the network  
18 portions with which the positioning information indicates the mobile node to  
19 be associated, is other than the home network portion; and

20 forming a roaming network table indicating with which of the network  
21 portions that the mobile node is capable of communicating responsive to  
22 associations formed during said operation of associating.

1 14. The method of claim 13 wherein said operation of detecting  
2 further comprises detecting values that identify the mobile node.

